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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,464	09/01/2004	Kiyoshi Yamaura	112857-464	8944
29175	7590	03/21/2006	EXAMINER	
BELL, BOYD & LLOYD, LLC			RUTHKOSKY, MARK	
P. O. BOX 1135			ART UNIT	PAPER NUMBER
CHICAGO, IL 60690-1135			1745	

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/506,464	<b>Applicant(s)</b> YAMAURA, KIYOSHI	
	<b>Examiner</b> Mark Ruthkosky	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-18 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10 and 14-18 is/are rejected.
- 7) ☒ Claim(s) 11-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/1/2004</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

The information disclosure statement filed 9/1/2004 has been placed in the application file, and the information referred to therein has been considered as to the merits.

### ***Drawings***

The drawings filed on 9/1/2004 have been approved.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 10, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohashi et al. (WO 98/50479.)

The instant claims are to a method for producing an electrochemical device composed of a first electrode, a second electrode, and an ion exchange membrane held between the first and second electrodes, comprising forming a catalyst layer containing a catalytic substance and polyvinylidene fluoride; and attaching one or more ion exchange groups to the polyvinylidene fluoride in the catalyst layer such that the catalyst layer contains the ion exchange groups that can be used for at least one of the first and second electrodes.

Ohashi et al. (WO 98/50479) teaches a method for producing an electrochemical device composed of a first electrode, a second electrode, and an ion exchange membrane held between the first and second electrodes. The electrodes are formed of iron, aluminum, cobalt, and nickel that form a catalyst layer, as noted in instant claim 15, and polyvinylidene fluoride (last paragraph of page 8.) Attaching one or more ion exchange groups to the polyvinylidene fluoride in the catalyst layer such that the catalyst layer contains the ion exchange groups that can be used for at least one of the first and second electrodes is noted on page 11. Carboxylic acids are taught as the ion-exchange group. Thus, the claims are anticipated.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuko et al. (JP 61-067787) in view of Ohashi et al. (WO 98/50479.)

Yuko et al. (JP 61-067787) teaches a membrane electrode assembly including a first electrode, a second electrode, and an ion exchange membrane held between the first and second electrodes. The reference teaches forming a catalyst layer containing a catalytic substance and fluorocarbon resin having ion exchange groups. Sulfonated polytetrafluoroethylene is taught as the membrane. The assembly is used in a fuel cell. The reference abstract (provided by the applicant) does not teach polyvinylidene fluoride as the ion-exchange binder material (a translation of the document will be obtained by the office.)

Ohashi et al. (WO 98/50479) teaches a method for producing an electrochemical device composed of a first electrode, a second electrode, and an ion exchange membrane held between the first and second electrodes. The electrodes are formed of iron, aluminum, cobalt, and nickel that form a catalyst layer, as noted in instant claim 15, and polyvinylidene fluoride (last paragraph of page 8.) Attaching one or more ion exchange groups to the polyvinylidene fluoride in the catalyst layer such that the catalyst layer contains the ion exchange groups that can be used for at least one of the first and second electrodes is noted on page 11. Carboxylic acids are taught as the ion-exchange group. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the binder material taught in Ohashi et al. (WO 98/50479) to bind the catalytic particles of Yuko et al. (JP 61-067787), as the Yuko reference teaches the binder shows improved adhesion between the binder and metal in the electrode. The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

***Allowable Subject Matter***

Claims 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter. Claim 11 is to a method that includes the steps of bonding the catalyst layer to a precursor of the ion-exchange membrane composed of polyvinylidene fluoride to form a bonded body and then bringing the bonded body into contact with a compound containing the ion-exchange groups and introducing the ion-exchange groups into the PVDF membrane in the bonded body through substitution. The prior art does not teach the steps of bonding the catalyst layer to a precursor of the ion-exchange membrane composed of polyvinylidene fluoride followed by bringing the bonded body into contact with a compound containing the ion-exchange groups and introducing the ion-exchange groups into the PVDF membrane in the bonded body through substitution. As these steps are not taught or suggested in the prior art, the subject matter of the claims may be allowable over the prior art.

***Examiner Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky

Primary Patent Examiner

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3-15-2006